PROJECT CHECO SOUTHEAST ASIA REPORT

USAF AERIAL PORT OPERATIONS IN RVN

Special Report

REPORT DOCUMENTATION PAGE

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4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)	8. PERFORMING ORGANIZATION REPORT NUMBER
Department of the Air Force Headquarters Pacific Air Forces, CHECO Division Hickam AFB, HI	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT

A -- Approved for Public Release

13. SUPPLEMENTARY NOTES

14. ABSTRACT

Project CHECO was established in 1962 to document and analyze air operations in Southeast Asia. Over the years the meaning of the acronym changed several times to reflect the escalation of operations: Current Historical Evaluation of Counterinsurgency Operations, Contemporary Historical Evaluation of Combat Operations and Contemporary Historical Examination of Current Operations. Project CHECO and other U. S. Air Force Historical study programs provided the Air Force with timely and lasting corporate insights into operational, conceptual and doctrinal lessons from the war in SEA.

15. SUBJECT TERMS

CHECO reports, Vietnam War, War in Southeast Asia, Vietnam War- Aerial Operations, American

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			19b. TELEPHONE NUMBER *(Include area code)*

PROJECT CHECO REPORT

Contemporary Historical Examination of Current Operations

USAF AERIAL PORT OPERATIONS IN RVN

5 AUGUST 1970

HQ PACAF

Directorate, Tactical Evaluation

CHECO Division

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PROJECT CHECO REPORTS

The counterinsurgency and unconventional warfare environment of Southeast Asia has resulted in the employment of USAF airpower to meet a multitude of requirements. The varied applications of airpower have involved the full spectrum of USAF aerospace vehicles, support equipment, and manpower. As a result, there has been an accumulation of operational data and experiences that, as a priority, must be collected, documented, and analyzed as to current and future impact upon USAF policies, concepts, and doctrine.

Fortunately, the value of collecting and documenting our SEA experiences was recognized at an early date. In 1962, Hq USAF directed CINCPACAF to establish an activity that would be primarily responsive to Air Staff requirements and direction, and would provide timely and analytical studies of USAF combat operations in SEA.

Project CHECO, an acronym for Contemporary Historical Examination of Current Operations, was established to meet this Air Staff requirement. Managed by Hq PACAF, with elements at Hq 7AF and 7AF/13AF, Project CHECO provides a scholarly, "on-going" historical examination, documentation, and reporting on USAF policies, concepts, and doctrine in PACOM. This CHECO report is part of the overall documentation and examination which is being accomplished. Along with the other CHECO publications, this is an authentic source for an assessment of the effectiveness of USAF airpower in PACOM.

ROLAND A. CAMPBELL, Major General, USAF
Chief of Staff

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CHAPTER I

INTRODUCTION

The USAF aerial port system in the Republic of Vietnam (RVN) was the common denominator for all in-country airlift operations.[1] This activity's primary function was that of terminal services support. It provided support for all U.S. military airlift aircraft in RVN, including the loading and offloading of cargo and the processing and manifesting of passengers. Mobility teams were included in the organization to provide a loading and offloading capability at locations not serviced by an aerial port. They assisted in the preparation and planning of unit moves and augmented aerial ports during surge operations. The organization also had Combat Control Teams (CCTs) which could be airlanded or paradropped into forward areas to furnish ground control for airdrops, extractions, or airlanded deliveries.[2] The Combat Control Teams and aerial delivery methods will be detailed in another CHECO report.

The 834th Air Division was activated in October 1966 to address the myriad of management problems associated with in-country tactical airlift operations. Each of the Division's first three commanders strongly attested to the critical importance of the aerial port function. In his End-of-Tour Report dated November 1967, Brig. Gen. William G. Moore, Jr., said:[3]

> *"When the intensity and magnitude of the airlift operations in terms of passengers, tonnage, and aircraft, exceed the rated capability of the*

aerial ports, the productiveness of each aircraft and aircrew unit decreases."

Maj. Gen. Burl W. McLaughlin, in his End of Tour Report dated June 1969, said:[4/]

"The effectiveness of sustained tactical airlift in Vietnam is controlled to a great extent by the capability of the aerial ports to respond to shifting tactical airlift requirements....Without adequate port facilities, equipment, and personnel to handle the widely fluctuating and diverse support requirements generated in a combat environment, tactical airlift can never realize its full potential."

In June 1970, Brig. Gen. John. H. Herring, Jr. commented:[5/]

"The aerial port units scattered throughout RVN, handling hundreds of tons of cargo and thousands of passengers each day, perform a critically important task of immense proportions. These ports represent a vital and necessary ingredient which turns aircrews and aircraft into an airlift system."

Much of the historical development of the USAF aerial port system in RVN was recorded in CHECO Reports "Assault Airlift Operations" and "Tactical Airlift Operations" published in February 1966 and June 1969, respectively. "USAF Aerial Port Operations in RVN" focuses on areas of facilities, materiel, communications, and personnel and enlarges upon major continuing problems of the aerial port program. In the words of General McLaughlin:[6/]

"A lack of adequate physical facilities, low materials handling equipment in commission rates, unreliable

communications, and the shortage of personnel have been long-standing problems impacting on aerial port operations."

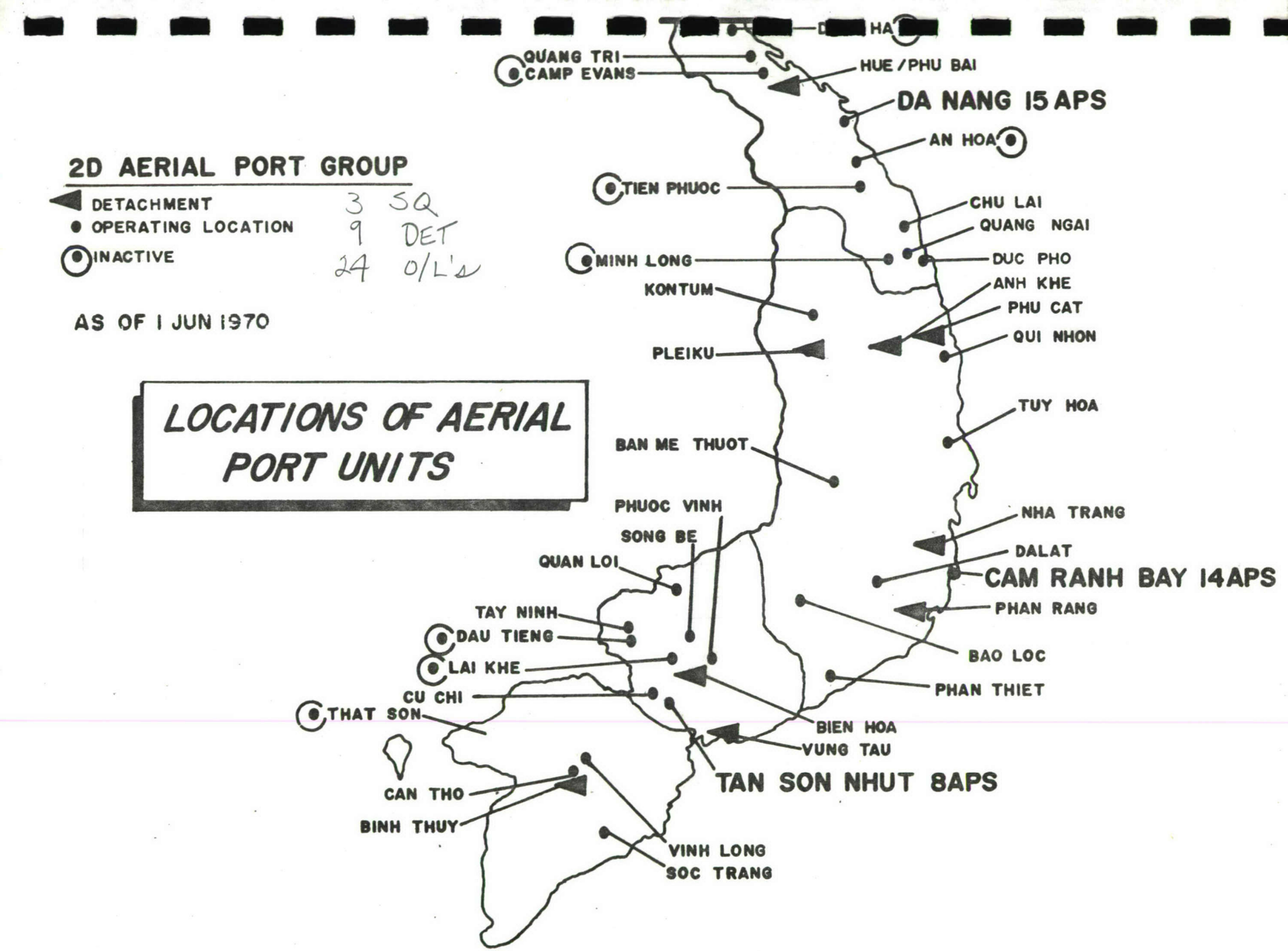
These impacts are described in this report with a view toward delineating valuable lessons learned. Frequent reference is made to recommendations of the First Annual Tactical Airlift Symposium held at Pope AFB, North Carolina, during 17-22 November 1969. Many of these recommendations addressed aerial port problems encountered in RVN.

CHAPTER II

FIXED AERIAL PORTS AND FACILITIES

The system of USAF aerial ports in RVN on 20 July 1962 consisted of four detachments of the 7th Aerial Port Squadron (APS) located at Pleiku, Tan Son Nhut, Da Nang, and Nha Trang Air Bases.[1/] The 7th APS, with headquarters at Tachikawa AB, Japan, was a subordinate unit of the 315th Air Division, also headquartered at Tachikawa. By 1 June 1970, the aerial port system in RVN had evolved from these four original terminals to an organization including more than 30 active units operated by the 8th, 14th, and 15th APS of the 2d Aerial Port Group (APOG), a subordinate unit of the 834th Air Division.[2/] Figure 1 depicts locations of these units as of 1 June 1970.

In mid-1970, fixed aerial port facilities in RVN ranged from large, fully-equipped terminals at major air bases to very austere terminals at remote airfields. An example of the former was the aerial port at Cam Ranh Bay shown in Figure 2. A completely new major aerial port complex was opened at Bien Hoa on 5 January 1970. It included an air freight terminal, passenger terminal, Airlift Control Element (ALCE) building, MAC Airlift Command Post building, snack bar, latrines, outside storage area, and a 40,000-pound pit scale.[3/] Major terminals such as Bien Hoa, Tan Son Nhut, Cam Ranh Bay, and Da Nang were capable of handling more than 1,000 tons of cargo and over 3,000 passengers per day.[4/]


2D AERIAL PORT GROUP
DETACHMENT
OPERATING LOCATION
INACTIVE
3 SQ
9 DET
24 O/L's
AS OF 1 JUN 1970
LOCATIONS OF AERIAL PORT UNITS
HA
QUANG TRI
CAMP EVANS
HUE / PHU BAI
DA NANG 15 APS
AN HOA
TIEN PHUOC
CHU LAI
QUANG NGAI
MINH LONG
DUC PHO
KONTUM
ANH KHE
PHU CAT
PLEIKU
QUI NHON
TUY HOA
BAN ME THUOT
PHUOC VINH
SONG BE
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PHAN RANG
DAU TIENG
BAO LOC
LAI KHE
PHAN THIET
CU CHI
THAT SON
BIEN HOA
VUNG TAU
TAN SON NHUT 8APS
CAN THO
BINH THUY
VINH LONG
SOC TRANG

FIGURE 1

Cam Ranh Bay Aerial Port Complex,
June 1968.
FIGURE 2

A number of intermediate-sized terminals, such as Chu Lai and Vung Tau, could meet workloads of 220 tons of cargo and 1,300 passengers per day.[5] (Figs. 3 and 4) At the extreme end of the fixed port spectrum were small austere terminals at remote airfields. These facilities were constructed principally on a self-help basis to at least provide storage space and passenger protection during adverse weather conditions. Manning of such units was normally limited to less than ten personnel, but they could be quickly augmented for heavy workloads such as large unit moves or other special mission requirements.[6] Typical of these remote ports was Soc Trang, shown in Figure 5.

Facilities problems at the aerial ports still existed in June 1970 but General Herring was able to say, "Much progress has been made in obtaining the facilities and in overcoming the problems that were an everyday part of our operation."[7] These "everyday facilities problems" received much attention in the early development of the aerial port system.

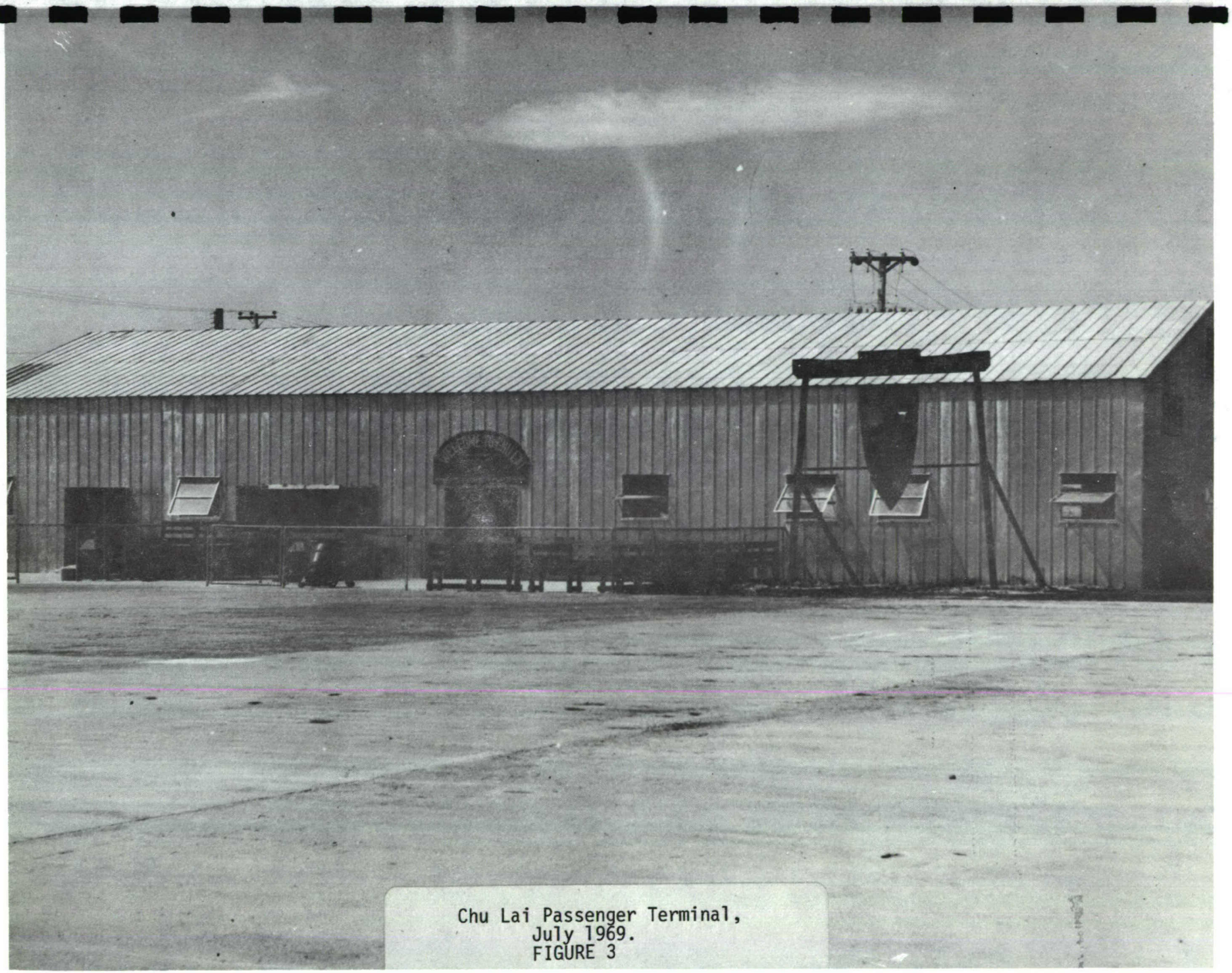
For example, opening of the first terminal snack bar in Southeast Asia at Da Nang in early 1963 was hailed as a milestone. On 17 June 1963, the 8th APS Headquarters moved from tents to permanent structures at Tan Son Nhut, and at about the same time, it was reported the air terminal office and passenger service lounge of Detachment 4 at Nha Trang were wired and that lights had been installed. These projects were done for the most part on a self-help basis, a method of operation

which became "SOP" for aerial port personnel in RVN.

The optimism and "can do" spirit of the "aerial porters" were very much in evidence during those early days. In August 1964, the newly activated detachment at Vung Tau was working out of a Conex container and tent. Windstorms flattened the tent and the cargo area was a "lake" during the rainy season.[8] Six months later after laying pierced steel planking in the cargo area and finding office space in permanent buildings, the detachment proudly proclaimed, "We have grown considerably from the old days of tents and mud hole cargo area."[9]

During this period of austere facilities at practically all terminals in RVN, aircraft delays chargeable to ports of the 8th APS remained remarkably low. The total number of aircraft departures from the aerial ports averaged nearly 3,500 per month during the first half of 1964, yet the delay rate chargeable to terminals never exceeded 0.2 percent, and in five of the six months did not exceed 0.1 percent.[10]

Terminal maintenance and security were particularly pressing problems for aerial ports in RVN. In December 1964, maintenance support for the passenger terminal at Tan Son Nhut was termed "not adequate." USAF civil engineers disclaimed responsibility since the building was a VNAF facility constructed under MAP funding. VNAF engineers were likewise reluctant to maintain the facility since it was operated by the 8th Aerial Port Squadron. Finally, responsibility for latrine maintenance was assigned USAF engineers and VNAF personnel were to provide needed



Chu Lai Passenger Terminal,
July 1969.
FIGURE 3

Vung Tau Passenger Terminal, Snack Bar and Cargo Holding Area, Apr 69.
FIGURE 4

Soc Trang Passenger Terminal,
June 1969.
FIGURE 5

maintenance for the rest of the facility.[11] This arrangement did not solve the problem since VNAF engineers did not possess U.S. replacement materials or parts with which the building was primarily equipped, or qualified personnel to perform the maintenance. In June 1965, latrine maintenance was being performed at the Tan Son Nhut terminal by USAF engineers and remaining terminal maintenance was being performed by 8th APS personnel on a do-it-yourself basis.[12] Many of these problems disappeared as the aerial port operation in RVN matured, however, problems with latrine maintenance persisted at nearly all aerial ports. As late as 22 May 1970, it was considered by the detachment commander at Nha Trang to be the major obstacle to providing professional caliber passenger service at that terminal.[13]

Security for passengers and cargo presented a continuing challenge for aerial porters. On 26 June 1964 at Tan Son Nhut, a bomb exploded about 20 feet from 55 Special Forces passengers and about 60 feet from a C-135 which was to airlift this unit back to the United States. Three men were injured slightly and no other damage or injuries was reported. An Air Vietnam baggage handler admitted that he was to have placed the bomb on the aircraft but could not do so without being observed. Three other Vietnamese had been bribed to overlook anything they observed that might seem "suspicious."[14] Aerial port shift chiefs performed daily periodic inspections of terminal premises checking on abandoned baggage, footlockers, boxes, and satchels that could not be readily associated with

an owner. Such items were immediately brought to the attention of Explosive Ordnance Disposal (EOD) personnel for clearance. Intensive security measures continued and in June 1970 nearly all baggage at major terminals was thoroughly checked for explosives before being loaded aboard 834th AD aircraft. Quality control personnel at Tan Son Nhut inspected each pallet of cargo immediately prior to loading to insure that loads had not been tampered with in any way. The sighting of unauthorized personnel in the proximity of aircraft was sufficient reason for offloading and searching the aircraft.[15/]

Problems in protecting cargo were a continuing facet of aerial port life as indicated by an incident at Nha Trang on 18 May 1970. A Vietnamese Marine unit was moving through the port and these men, along with their equipment, were in the cargo holding area which was neither adequately fenced nor illuminated. Normally, port personnel were able to keep the area under close surveillance. However, several aircraft came in between 2100 and 2300 hours and required all the reduced night force to help with their servicing. For a short time, the cargo holding area was unattended. When port personnel returned to the area, they found several pallets had been pilfered, and 75 to 80 cases of canned fish, several cases of medical supplies, and one bag of U.S. letter mail were missing. A general search of the unit's equipment by Vietnamese and American security personnel recovered some of the fish, most of the medical supplies, and the mail. The person taking the mail had

apparently wanted only the bright red mail sack for his personal gear. This affair uppointed the need for more fencing and better lighting, a need which characterized many of the aerial ports throughout RVN.[16/]

Congested and poorly located facilities plagued the aerial ports in RVN. Brig. Gen. William G. Moore, Jr., first Commander, 834th Air Division, described this serious problem on 26 January 1967:[17/]

> *"Cargo processing areas in which our aerial ports must operate have few hard surfaced areas. Palletization and handling are being accomplished in the mud or on the aircraft parking ramps. The aerial port mission is further hampered by the lack of adequate covered storage areas to protect freight during processing. For example, at Tan Son Nhut over 50 percent of the cargo open processing is in mud. In the passenger area, we are processing personnel in the most inadequate facilities imaginable. During December 1966, the aerial ports processed over 400,000 passengers utilizing Conex containers, tents, and small crowded buildings at terminal facilities. Another factor that detracts from our aerial port capability is the congested ramp areas on which we work. Many of our stations are so crowded with other tactical missions that our airlift aircraft must wait for a chance to park or even circle awaiting ramp space at some of our smaller strips. At other bases we are processing cargo in as many as three separate areas in order to obtain room to handle all the port requirements. All of these factors contribute to excessive turnaround times and their impact on aircraft utilization is a matter of primary concern to me. Delays are being reduced but not at the rate we would like to see."*

As was expected in such a fluid tactical situation, nearly all problems concerning port facilities were destined to persist in some degree throughout the war. However, significant gains were constantly being made at the major ports. For example, in June 1968, an entire

aerial port complex, consisting of 8,000 square feet (SF) of covered cargo area, 90,000 SF of open cargo area, and an 8,000-SF passenger terminal, was well on its way to completion at Da Nang. In addition, a 4,500-SF passenger terminal at Nha Trang was nearing completion; 50,000 SF of open cargo area was being added to the existing area at Phu Cat; paving of 20,000 SF of open cargo area was progressing at Pleiku; and paving of the 32,000-SF Army air cargo area at Tan Son Nhut was almost completed.[18/] Despite such gains, General McLaughlin, in reviewing the entire port system in June 1969 commented, "Many passenger terminals are grossly inadequate, storage areas are cramped and often poorly located."[19/]

General Moore in commenting on "congested ramp areas," and General McLaughlin on "cramped and poorly located storage areas," were pointing up a most important lesson learned and one which could largely be precluded in future contingencies with proper planning. That lesson was the need to include sufficient and properly located real estate for aerial port complexes in the planning of air bases. General Herring said, "Adequate space at the right locations has been our big problem, not the cost of most facilities."[20/]

The "largest and foremost" problem facing the Air Freight Section at Tan Son Nhut in June 1966 was one of space. The unit's originally assigned real estate was reduced by 25 percent, while its workload was increased by 50 percent. Added to this was the handicap of having

to operate from three separate cargo handling locations.[21] Congested and poorly located storage and loading areas could not be attributed solely to the fact that USAF aerial ports had to take the space that was available at established airfields such as Tan Son Nhut. The situation was not much better at Cam Ranh Bay and Phan Rang, both of which were planned and constructed by U.S. forces. At Cam Ranh Bay, cargo had to be hauled as much as one and a half miles between the port area and parked aircraft.[22] At Phan Rang, more than a nine-mile round trip by flat-bed trailer between port facilities and aircraft loading/offloading points was a routine part of the cargo handling operation.[23] As Col. Robert A. Vrilakas, Vice Commander, 2d APOG said:[24]

> *"We can expect a buildup period in aerial port operations in future contingency operations. It is safe to assume that our effort will be an expanding one at nearly all major and intermediate ports. Why not initially dedicate sufficient and properly located real estate to the port complexes that we can surely expect to be eventually required?"*

This matter received attention at the First Annual Tactical Airlift Symposium. A Symposium Panel agreed that:[25]

> *"History of airlift operations has proved that aerial ports rarely are afforded adequate real estate to sufficiently accomplish the assigned mission when deployed in support of contingency operations/exercises....Additional requirements for real estate and structural facilities are not normally made available to the aerial port without considerable realignment of various support functions throughout the area of deployment."*

The panel went on to point out that vital cargo handling equipment should not be obligated to moving cargo over great distances from ramps to holding areas, since it then became a decisive factor in determining the timely movement of airlift in and out of a given site. It was unanimously agreed that "port" operations should be located as near the parking ramp as possible and that appropriate recognition be given to the allocation of space and structures for aerial port operations when deployed to a base where allocation of space was not predetermined. The panel recommended that "planning factors be developed and published that will facilitate the allocation of real estate for aerial port use."[26/] If the panel's recommendation was a prelude of definitive action to follow, then one of the most difficult and trying lessons learned in RVN with respect to aerial port facilities would not have to be learned again in future contingency operations.

CHAPTER III

MATERIEL

The lifeblood of the aerial ports in RVN was the 463L Materials Handling Support System. This system of five "families" of equipment was designed for worldwide deployment to "provide a complete materials handling system compatible with all modes of transportation required to accomplish the Department of Defense logistics and aerial delivery system."[1/] The 463L Materials Handling Equipment (MHE) was introduced in RVN in 1964 and was thereafter plagued with two major recurring problems: poor in-commission rates and shortages of pallets and restraint equipment.[2/]

Materials Handling Equipment

The MHE vehicles of greatest concern to the aerial ports were the various forklifts and K-loaders, two of which are shown in Figures 6 and 7. The critically important role played by these vehicles in airlift operations was pointed up by General Moore on 10 January 1967:[3/]

> *"Our greatest limitation in the airlift system now is the lack of MHE, that is, the equipment that the aerial port must have to palletize loads and to load the pallets on and off aircraft. Right now we are operating with approximately 39 percent of the forklifts which we need to do our job and some 42 percent of the K-loaders which we need to do our job today. The problem has been highlighted all the way up through the AF system and is getting expedited and emergency attention at this time. With additional ground handling equipment and the parts support to keep the equipment operating, we believe we can increase our tonnage anywhere from 10 to 21 percent without any increase in the numbers of aircraft assigned to us.*

The MHE which we have was not designed for continuous operation or for operation in the environment of dirt, sand, and mud in which we now operate the equipment at many of our isolated and dirt airstrips."

General Moore's efforts significantly increased the number of pieces of MHE in RVN. In November 1966, he had 423 pieces authorized with 279 assigned. A year later, 442 pieces were authorized and 418 were on hand.[4/] The in-commission rate had also improved significantly due to better spare parts support, establishment of a component rebuild program at Clark AB, Philippines, and visits in-country by AFLC 463L maintenance teams. General Moore believed the experiences with MHE in RVN provided valuable lessons which should be used as a guide in developing future MHE and the programming of maintenance and supply support of this vital equipment. He emphasized that experience factors based on "Stateside" development programs were not always compatible with the kind of continuous and tortuous operation to which his MHE was subjected in RVN.[5/]

In June 1969, General McLaughlin was finding shortages of authorized MHE remained a major constraint on aerial port operations. According to the General at that time: "Although this situation has improved considerably, we are still short nine K-loaders and 59 fork-lifts, our most critically needed items."[6/] Commenting on experience factors for MHE, he sounded the same note as had General Moore:[7/]

10K Forklift with 463L Pallet,
Tan Son Nhut AB, RVN, 5 Jun 70.
FIGURE 6

40K Aircraft Loader, Tan Son Nhut AB,
5 June 1970.
FIGURE 7

"The replacement cycle for MHE is unrealistic for this combat environment. For example, under normal operating conditions the life expectancy of a forklift is eight years. That standard cannot be achieved here, given the conditions that exist. The excessively high operating times, often on unprepared surfaces, cause severe wear and tear on hydraulic systems, transmissions, and axles. The operation of forklifts in dust, mud, and sand, over rocks and PSP, and in heavy rains, necessarily has a debilitating effect on vehicle systems. These factors shorten the useful life of MHE in Vietnam by 50 percent. More realistic formulas should be developed for replacing MHE committed to a combat environment. Equipment must be phased through the various replacement codes at a faster rate, with replacement of forklifts programmed for the fourth instead of the eighth year."

General McLaughlin called for expedited delivery of mission essential equipment to fill valid authorizations. He noted that many MHE authorizations were developed only after experience in the field revealed a shortage of such equipment and that deliveries of equipment normally followed authorizations by 9 to 18 months.[8/]

An encouraging exception to this "normal" time sequence for obtaining equipment to fill authorizations occurred in early 1970. Col. Howard E. Bettis, Commander, 2d APOG, attended the Seventh PACAF Vehicle Support Conference which convened on 14 January at WRAMA, Robins AFB, Georgia. As a result of his presentation of the critical need for MHE to fill initial shortages of 10K Adverse Terrain (AT) forklifts, 16 of those vehicles were airlifted to RVN by 21 April.[9/] They arrived in RVN in time to provide "indispensable" support for the Cambodian operation in May 1970.[10/] The 10K(AT) forklift introduced in RVN in 1968

represented one of the most significant developments of the war so far as MHE was concerned. Figure 8 shows one of these vehicles in action at a forward airfield during the Cambodian operation in May 1970. This modified version of a front end scoop loader designed and manufactured by Euclid Division of General Motors Corporation quickly won the approval and praise of aerial port personnel for its ruggedness and reliability. They were used at all aerial port detachments and operating locations, and were deployed on mobility operations throughout RVN where swampland, sand, and mud were the rule, not the exception. The diesel powered 10K(AT) proved to be far superior in every respect to its forerunner, the 10K Rough Terrain (RT) forklift which is shown in Figure 9.[11/]

General McLaughlin believed the 10K(AT) forklift represented a valuable lesson learned and suggested exploring the possibility of diesel power for all MHE.[12/] In April 1970, this idea seemed to be gaining favor when it was announced that economics of conversion of 40K-loaders to diesel power was being studied by AFLC, and that first production delivery of new diesel 40K-loaders was expected in May 1971.[13/]

MHE operating in RVN was vulnerable to combat damage. Ground fire and shell fragments took a heavy toll of tires, hydraulic lines, and radiators. On numerous occasions, forklifts were inoperable solely because of blown tires.[14/] General McLaughlin's staff developed Southeast Asia Operational Requirement (SEAOR) 174 in 1968 calling for battle-damage-proof tires.[15/] On 30 May 1970, Col. Victor Lisec, Commander,

10K Adverse Terrain Forklift at Katum,
3 May 1970.
FIGURE 8

10K Rough Terrain Forklift.
FIGURE 9

Tire change for 10K(AT) Forklift,
Long Thanh 3 May 1970.
FIGURE 10

8th APS, expressed concern because battle-damage-proof tires had not been received in RVN; he cited experiences during the first month of the Cambodian operation which uppointed the need for such tires. In the first month of that action, 19 10K(AT) forklifts required 24 tire changes, one of which is shown in Figure 10. Cost of replacement tires was $4,853.04, and a total of 408.5 hours of MHE out-of-commission time was experienced. A total of 33,600 pounds of airlift costing $6,782.00 was required to transport tires to forward operating locations and return unserviceable tires for breakdown.[16/]

The first ten sets of battle-damage-proof tires were received in RVN on 3 June 1970. They were installed the same day on 10K(AT) forklifts and 25K-loaders at Tan Son Nhut, Cam Ranh Bay, and Da Nang, ready for deployment to the field.[17/] The development of battle-damage-proof tires, coupled with recommendations coming from the First Annual Tactical Airlift Symposium, gave promise that future MHE would be better suited for deployment to combat zones than had been the MHE in RVN.

A panel of the Symposium recommended that protection kits for MHE should be provided which could be installed in two hours or less by one man. Such kits were to protect radiators, hydraulic systems, fuel lines and tanks, tires, and the operator's position from battle damage.[18/]

In June 1970, General Herring was looking first to the past and then to the future when he said:[19/]

"We have used 463L MHE to satisfy requirements never envisioned by its designers. What we need to do now is develop equipment to meet the kinds of requirements we have discovered in RVN and which we may expect in future contingencies....In the development of new airlift aircraft, related MHE and cargo handling procedures should be part of the package."

The general further suggested that some attention might profitably be devoted to compatibility between Army and Air Force MHE. He pointed out that Army helicopter pads usually adjoined runways at forward airlift airfields, as shown in Figure 11, but that considerable time and effort were expended in transferring cargo from one airlift system to the other. It was his belief that the need for increased compatibility between Army and Air Force cargo handling systems warranted further study.[20/]

MHE Maintenance

No more important lesson was learned in RVN with respect to aerial port operations than the one having to do with maintenance of MHE. It was clearly evident that transportation squadrons did not usually have sufficient manning in the skills required to maintain the equipment properly.[21/] During 1968, the manning of in-country 463L maintenance shops varied from one mechanic per 18 vehicle equivalents to one per 30 vehicle equivalents; PACAF-desired manning was one mechanic per 14.5 vehicle equivalents. In a letter to 7AF(DM) on 22 March 1968, the Commander, 834th AD, solicited "urgent command assistance in developing a compatible degree of support for MHE and the 463L system in Vietnam."[22/]

Air Force-Army Airlift Interface at Katum, 3 May 1970.
FIGURE 11

He pointed out that the average in-commission rates for forklifts and K-loaders for the six-month period ending 29 February 1968 were 66 and 72 percent, respectively, as opposed to the PACAF standard of 92 percent. Vehicle-deadlined-for-parts (VDP) rates of 13 and 9 percent and vehicle-deadlined-for maintenance (VDM) rates of 20 and 19 percent for forklifts and K-loaders, respectively, were having "a direct effect on operational rates."[23] The factor which kept MHE in-commission rates from falling and remaining at disastrously low levels was the insertion of AFLC and PACAF maintenance teams periodically on a TDY basis. These teams were of invaluable help and relieved, temporarily at least, dangerously low in-commission rates.[24]

This kind of "maintenance brinksmanship" convinced men of the aerial ports that an organically assigned maintenance capability offered a promising solution to this serious problem.[25] General McLaughlin believed that such action would provide port commanders with the necessary capability and flexibility to respond to maintenance contingencies.[26] On 6 October 1969, Col. Robert J. Sunde, Commander, 2d APOG, took the same stand, pointing out that "each time the situation has become a problem, it has been because the local maintenance force was not adequate to support our equipment." He also advanced the premise that an organic maintenance force for the aerial ports would improve the situation.[27]

This position was gaining support in other quarters as evidenced by panel recommendations at the First Annual Tactical Airlift Symposium. A panel concluded that placement of maintenance manpower and tool

authorizations within host base vehicle maintenance organizations had proved highly unsatisfactory, particularly when MHE equipment was deployed. It recommended that "immediate organizational action be taken to provide all aerial port units with organically assigned 463L maintenance authorizations."[28/] No matter what type of maintenance organization was to evolve, aerial port personnel were unanimous in their belief that special identifiers should be developed for 463L mechanics to avoid dilution of this vital resource in the AF pool of "general vehicle" mechanics.[29/]

463L Pallets

The 463L pallets were absolutely essential to rapid and efficient handling of cargo. They permitted preparation of cargo for airlift prior to arrival of aircraft and the processing of terminating cargo after aircraft departure. Their use, as shown in Figure 12, obviated the need for laborious and time-consuming "floor loading" and tiedown. By using 463L pallets, a C-130 could be completely offloaded and reloaded in 15 minutes.[30/] This ability to offload rapidly was of overriding importance when cargo was delivered to forward airfields in high-threat areas. However, it was in such operations that an appallingly high loss rate of pallets and restraint equipment occurred. At times, losses of these assets had a severe impact on airlift capability.[31/]

These losses occurred principally at the more than 100 airlift airfields which did not have permanent aerial port representation. Cargo was delivered to these locations on pallets with the understanding that

10K Forklift moving Balletized Cargo aboard C-123.

FIGURE 12

users would remove it and leave the pallets for later recovery by aerial port mobility teams and 834th AD aircraft. All too often, the pallets were diverted to other uses by military forces or local nationals. Pallets offered excellent construction material for bunkers, bridges, driveways, tent floors, and shelters of all designs.

A concerted pallet recovery program was initiated in late 1968 involving the combined efforts of the 834th AD Airlift Control Center, aerial port mobility teams, aircrew members, and Army airfield personnel. A MACV directive established policy, responsibilities, and procedures for the control, recovery, and return of 463L pallets and restraint equipment to the MACV Common Service Airlift System. The directive was applicable to all MACV staff agencies and subordinate commands.[32/] The first Annual Tactical Airlift Symposium noted the MACV directive and recommended that a joint service directive be prepared establishing service responsibilities and guidance for assuring positive control of 463L pallets and restraint equipment in a theater of operations.[33/]

Progress in pallet recovery was indicated during the first four months of 1970 when record numbers of pallets and restraint equipment valued at $3,152,353.00 were recovered from airfields not having permanently assigned aerial port units. Apart from monetary considerations, General Herring commented, "Pallet recovery is worth our every effort since they give the airlift system so much capability. The problem must receive our concerted and continued attention."[34/]

Weighing Equipment

A continuing deficiency in weighing capability harassed aerial ports in RVN for years.[35] Such capability was needed throughout the port system so that aircraft could be safely loaded. It was considered particularly important that some capability for accurate weight determination be provided mobility teams operating at austere forward airfields. In June 1967, General Moore said:[36]

> *"When an Army unit moves from one field location to another, there is no way of accurately determining the weight of much of the cargo and rolling stock that must be airlifted. The contents of locked Conex containers, for example, cannot be verified. Nor can the accurate weight of a mud-laden truck full of foot lockers and tool kits be accurately estimated. In certain cases, this creates an aircraft safety problem due to possible overgrossing. Continual stress should be made to obtain an adequate portable weighing capability."*

The continual stress called for by General Moore took the forms of SEAORs 82 and 102 and brought portable weighing equipment to RVN. In August 1968, the Mobile Electronic Weighing System (MEWS) was introduced.[37] This was a self-contained, self-powered, mobile weighing unit designed to operate under austere conditions. Each trailer unit was air transportable and could be palletized on a single 463L pallet. The system could supposedly weigh any type of airlift cargo. On 1 June 1970, ten of these units were on hand in RVN and four were in commission. Calibration and spare parts had proved to be problems and avionics personnel were not fully qualified to perform necessary maintenance.[38]

Another device made available to the aerial ports was an off-the-shelf item, the Martin-Decker hydraulic lift-truck weight indicator. Those units began arriving in June 1969 and were installed on 10K(RT) and 10K standard forklifts.[39] This device proved very effective under testing at Pope AFB but met with marginal success in RVN. Aerial port forklift operators found it confusing to operate and despite extensive training programs, they lacked confidence in weight information obtained with it. More importantly, the 10K(AT) Euclid forklift, which came into use on practically all mobility operations, had no integral weighing capability. However, testing in early 1970 at the Tactical Airlift Center, Pope AFB, indicated that a Martin-Decker hydraulic weight indicator could be successfully adapted for use with the 10K(AT) forklift. If this proved to be correct, the problem defined by General Moore in June 1967 was nearing solution in June 1970.

Calibration and maintenance of other aerial port weighing equipment also presented continuing problems. The 13 MA-1 vehicle weighing kits in RVN were used to weigh all types of cargo at all kinds of locations. However, these kits were easily damaged in the field and had to be returned to CONUS for repair at depots. Pipeline time was long since these heavy instruments were usually shipped by sea transport. On 1 June 1970, only 5 of the 13 MA-1 kits in RVN were in commission.[40]

At the same time, two of the six 60,000-pound capacity pit scales in RVN were in commission. Calibration was the chief difficulty and could be performed only by Fairbanks Morse personnel from the United States. Obtaining this service was a time-consuming process. A field

engineer was expected in RVN on 22 June 1970 in response to a requirement established in late 1969.[41/]

Twenty-five of the twenty-three-pound-capacity, low-profile scales in RVN were in commission on 15 June 1970. Many of these scales were new and had arrived during the previous three months, however, calibration problems were anticipated. No serious problems with baggage scales had developed, probably because these were the only weighing devices in the aerial port inventory that PMEL personnel were authorized to maintain. This fact in itself possibly represented a valuable lesson learned.[42/]

Aerial port personnel managed to keep the cargo safely moving in RVN with the weighing equipment that was available and with weight estimates. Some aircraft overloading occurred on rare occasions, however, estimated weights were most likely to have been on the "heavy" side. Maj. Ralph C. Alexandre, Director, Materiel, 2d APOG, said, "We will never be able to determine the amount of airlift wasted in RVN due to nonavailability of accurate cargo weight information." In June 1970, he considered maintenance of weighing equipment to rank with pallet recovery as the chief problems of aerial ports, with no satisfactory solution in sight.[43/]

CHAPTER IV

PORT COMMUNICATIONS

The problem of communications at a remote aerial port detachment was generally similar to the situation described in this report from Phuoc Vinh in June 1966:[1]

> *"The greatest problem since activation, with no improvement to date, is the communications system. It is extremely difficult and time-consuming to communicate with other locations, except within the 1st Division area and except by mail....No realistic 'get well' date can be foreseen."*

This prediction of a delayed "get well" date stated in the Phuoc Vinh report was all too correct. In June 1969, General McLaughlin in commenting on the lack of adequate communications between port locations said, "We are now forced to rely solely on nondedicated land line communications which are completely unsatisfactory."[2] The general believed this lack of adequate communications was causing considerable waste of valuable airlift because essential traffic information from outlying users could not be coordinated on a timely basis.

It was impossible for aerial port units to apprise down-line stations as to aircraft loads so they could preplan passengers and cargo for these scheduled flights. Land lines were not available throughout the port system, and where they were available, a telephone call could take hours to complete. ALCE communications were not available in many locations and aircraft movement information took precedence over traffic

information.[3] This situation resulted in two options: increased ground time or denial of available cargo load. The result of either option was an inflated investment in airframes to accomplish the airlift mission.[4]

In late 1969, installation of 37 high frequency single side band (HF/SSB) radio sets was in progress throughout the aerial port system in RVN. This HF/SSB network, under auspices of local communications squadrons, consisted of four segments. Each of the three aerial port squadrons possessed a net connecting nearly all of the squadron's detachments and operating locations on an assigned dedicated frequency. A fourth net connected the three squadrons with the 2d APOG Headquarters at Tan Son Nhut on still another assigned dedicated frequency. This system was 93 percent operational on 1 June 1970.[5]

The long wait for an acceptable aerial port communications system convinced many port personnel that a communications capability should be organic to its organization.[6] The First Annual Tactical Airlift Symposium was also on record as recommending the authorization of HF/SSB radio equipment as part of the in-house communications for aerial ports.[7]

An even more exciting development was expected to be implemented during the summer of 1970. This was the Airlift Management System (ALMS), a computerized aircraft scheduling system. A part of its capability was expected to be of great benefit to the aerial ports. The ports were to submit their cargo backlogs daily to the ALMS

computer and, in turn, receive a fragmentary order covering the next day's missions. The order was to identify the amount and type of cargo scheduled to move from each port, as well as the cargo to be received. This system held great promise for aerial ports and in June 1970, the extent to which it could be exploited remained to be seen.[8/]

CHAPTER V

MANPOWER AND PERSONNEL

The formidable problems with facilities, materiel, and communications mentioned in the previous chapters would have taxed severely a properly manned and highly experienced aerial port force. The assigned strength of aerial port units consistently lagged behind authorizations and the lack of transportation personnel resources in the CONUS necessitated heavy augmentation of the force with cross-trainees.[1/] In light of this situation, the achievements by aerial ports in RVN were all the more remarkable.

Civilianization of CONUS aerial ports led to the lack of trained and experienced port personnel.[2/] To meet the demand, NCOs and airmen were transferred from other career fields to SEA authorizations. In many cases, these personnel received only a brief two-week course in aircraft cargo loading prior to their arrival in RVN and some of their attitudes reflected less than high motivation. Some of these men were in the later years of their military careers, and found no incentive to remain in a career field which offered limited promotional opportunities and for which they were so unprepared.[3/] However, the overall high caliber of assigned personnel was the reason for success of the aerial port mission despite extremely heavy workloads, inadequate facilities, equipment, manning, and supplies.[4/] Extremely heavy workloads were commonplace and the following report from Nha Trang in 1965 was typical of aerial port activities throughout RVN:[5/]

"The Detachment experienced a marked increase in workload during the reporting period. The greatest increase occurred during the period 1 April to 30 June. It should be noted that the 94 percent increase in cargo processed and 44 percent increase in passengers processed was not accompanied by any manpower increase."

From the detachment at Qui Nhon came a similar report:[6/]

"The Detachment lost 4 enlisted men without replacements during May and June (1965). The Detachment is at present down to nine enlisted personnel and one officer with an increase in tonnage from 862.8 tons for May to 2,501.8 tons in June 1965."

Aerial ports suffered chronically from a lack of sufficient authorized and assigned personnel. In November 1966, 2,101 personnel were authorized to handle aerial port functions in RVN. By November 1967, this authorization had increased to 2,498 and manning had risen from 83 percent to 98 percent of authorized strength.[7/] However, when compared with PACAF manpower standards, the aerial ports in RVN were short 514 authorizations in late 1967.[8/]

The lack of qualified personnel was still sapping capabilities of the aerial ports in 1967 and generated the need for an extensive training program in RVN to upgrade or cross-train inexperienced personnel. In January 1967, 88.8 percent of all aerial port personnel were in upgrade or retraining status.[9/] Of all personnel assigned, 57.2 percent were retraining from either supply or administrative career fields into the transportation field. Further, 21.4 percent were in

upgrade training in their primary career fields and only 11.2 percent of aerial port personnel were qualified in grade.[10] By November 1967, significant progress had been made and the training program was reduced to 62 percent of assigned personnel. Importantly, only 8.6 percent were in cross-training, while the remainder were in upgrade training in their primary field.[11] Serious personnel problems remained, however, and manning was so critical during the 1968 TET offensive that assistance from out-of-theater resources had to be employed. Approximately 400 TDY personnel from USAFE, PACAF, and CONUS augmented the aerial ports in RVN until May 1968.[12]

By June 1970, serious shortages in authorization and manning, as well as in trained personnel, seemed to be a feature of the past. With the phasing down of the war in RVN, commanders had time to provide training programs designed to refine and polish skills as opposed to having to teach them from first principles. In April 1970, the 14th APS at Cam Ranh Bay was able to initiate classes each day for MHE operators. Prior to that time, personnel could not be spared "off the line" for that kind of individual instruction. MHE operators at Cam Ranh Bay were preparing for a "463L Rodeo" which would determine select crews to service C-5A aircraft, expected there later in the summer.[13] Nearly all manpower and personnel problems throughout the aerial port system in 1970 related to 463L/MHE maintenance which was discussed in Chapter III.

Actions were recommended at the First Annual Tactical Airlift Symposium to improve the present and foreseeable future aerial port manning situation. One of these recommendations was that future aerial port cross-trainees be permanently identified as such by the placement of an identifier on their AFSC or the awarding of a special experience identity code. According to a symposium panel, "This would enable the individual to work in his primary functional area during CONUS assignments and still be available for aerial port use in overseas areas in a PCS status or when otherwise required to meet tactical situations."[14/] Another symposium recommendation was that aerial port reserve units be authorized and manned, but not be tied to a parent reserve airlift unit. Such units would insure the availability of aerial port personnel for call up independently of flying units when the situation warranted.[15/]

CHAPTER VI

MOBILITY OPERATIONS

The emblem of the 2d Aerial Port Group contained the figure of a "minuteman" of the American Revolutionary War, signifying the readiness of aerial port personnel to take the field at a minute's notice. It was the opinion of Col. Howard E. Bettis, Commander, 2d APOG, that an equally appropriate name for aerial port personnel was that of "middlemen" since they served as the link between airlift aircraft and the customers, or users.[1/] No better example of the readiness of minutemen and the position of middlemen was found in RVN aerial port operations than the mobility teams.

Approximately 100 airlift airfields in RVN did not require an aerial port facility on a sustained basis. When a sizable tactical airlift operation developed at one of these airfields, an Aerial Port Mobility Team was deployed to support the effort. This activity was included in that part of the aerial port mission which called for operation of mobile terminals.[2/] Col. Victor Lisec, Commander, 8th APS, said, "A mobile terminal in RVN amounts to a six-man mobility team and a 10K(AT) forklift."[3/] These six men, operating in a most austere and hazardous environment, were expected to perform nearly all the functions of an established fixed aerial port.[4/]

Mobility teams normally consisted of a loadmaster and five air freight specialists. In Colonel Lisec's squadron, all mobility team

personnel were volunteers, however, each of the three Aerial Port Squadrons developed individual organizations and methods of operation.[5] Some mobility personnel believed a single mobility unit for the Group, rather than three squadron units, would have resulted in a smoother and more responsive operation.[6]

The teams traveled "light," taking only enough equipment and rations to sustain operations for five days. This practice was found best in view of restricted airlift available to teams, relatively brief deployments, and required security for team gear.[7]

Mobility team assignments included helping users plan unit moves, marshaling loads, loading and offloading aircraft, and pallet recovery missions. An example of assistance with unit moves was Operation LOCUST GREEN in 1968. Elements of the 101st Airborne Division were relocated from their Phuoc Vinh base camp to Dak To to help disperse a concentration of hostile forces operating in that area. Mobility teams from the 8th APS and 15th APS participated in the movement; they handled 1,520 tons of cargo and 5,768 passengers.[8] In Operation DELAWARE-LAMSON, conducted in the A Shau Valley in 1968, a mobility team moved 3,088 tons of cargo and 600 passengers, and remained throughout the operation to redeploy the forces upon its termination. It was reported that this mobility operation was performed under conditions of "high risk and extreme austerity."[9] Such conditions were the norm for mobility teams and their many acts of heroism under hostile fire placed them among the most highly decorated personnel of the 834th Air Division.

Quite often, mobility teams remained in the field overnight and found shelter wherever they could, usually in compounds and bunkers near forward airfields. When this happened, they were expected to take regular turns at guard duty. Mobility team members were called upon to man M-60 machine guns, trigger Claymore mines, operate communications, build bunkers, and stretch wire.[10/] An Air Freight Specialist with only M-16 training could find himself atop a bunker manning an Army crew-served weapon in the midst of a sapper attack.[11/] These personnel proved to be apt pupils and of necessity quickly mastered such weapons; however, such incidents pointed up the need for more and better training of all mobility team personnel before deployment in a combat situation.[12/]

The Cambodian operation in May 1970 was heavily supported by mobility teams from all three RVN Aerial Port Squadrons. Some loaded hundreds of tons of ammunition aboard 834th AD aircraft, while others handled cargo for the 1st Air Cavalry Division, one of the first combat units to move into enemy sanctuaries. Still others deployed to numerous airfields along the border to offload aircraft, one of which is shown at Katum in Figure 13, on 3 May 1970. These fields ranged from Djamap down to Moc Hoa in the Parrot's Beak.[13/] Mobility teams moved 16,000 tons of cargo in May 1970. This accomplishment compared with the 25,000 tons of cargo normally handled each month by the 8th APS at Tan Son Nhut.[14/]

Mobility Team in action at Katum,
3 May 1970
FIGURE 13

Events in RVN had shown that mobility operations were smoothest when teams were experienced and well trained.[15] Here again aerial port personnel were hoping that men with combat mobility team experience would be identified in the event they were needed in future contingencies. This identification and the need for more intensive training for this highly specialized task were the primary concerns of aerial port mobility personnel in June 1970.[16]

CHAPTER VII

SUMMARY

The aerial ports in RVN were a vital part of the largest and most complex sustained tactical airlift operation in history. The air transportation of men and materiel was statistically staggering. For example, in 1969 the 934th Air Division airlifted more than 4.5 million passengers, the equivalent of the combined populations of Boston, Detroit, Cincinnati, Dallas, Oklahoma City, Omaha, and Honolulu. The 1969 total weight of cargo, mail, and passengers airlifted in RVN was more than 1,341,000 tons.[1/]

These figures have to be doubled to gain a realistic indication of the magnitude of the task performed by the aerial ports. A ton of airlifted cargo was usually handled two times by aerial port personnel, once during loading and again during offloading. The same held true in the processing of passengers aboard as well as off aircraft. The accomplishments of the ports were all the more remarkable in light of the problems described in this report.

Emphasizing the critically important role played by aerial ports in tactical airlift, General Herring said:[2/]

> *"As we look beyond the operation in RVN, we should guard against a tendency demonstrated in the past to draw down heavily on aspects of the airlift system that are not constantly exercised in peacetime such as the aerial port function. If we are going to maintain "x" amount of tactical airlift capability, then we need to determine and maintain a corresponding minimum amount of aerial port strength. That minimum amount should be based on*

a capability to expand rapidly."

It was General Herring's belief that some actively maintained aerial port organization oriented toward tactical airlift would be necessary if progress based on experiences in RVN were to be achieved. The kind of active, progressive aerial port nucleus capable of rapid expansion envisioned by General Herring addressed a need voiced by Col. R. M. Chapman at the First Annual Tactical Airlift Symposium. He said, "In the future, we must have an aerial port organization in being complete with trained personnel and materials handling equipment. Ready for deployment...."[3/]

Important lessons had been learned with respect to facilities, material, communications, and personnel during the RVN airlift operation. Whether these lessons learned would be capitalized upon to preclude the long and costly buildup of aerial port operations in future contingencies was a question that in June 1970 was yet to be answered.

FOOTNOTES*

CHAPTER I

1. (U) AFP, 7AF, No 55-1, "7AF In-Country Tactical Air Ops Handbook," 20 Mar 68, pg 90.

2. Ibid.

3. (U) End-of-Tour Rprt, Brig Gen William G. Moore, Jr., Comdr, 834th AD, Oct 66 - Nov 67, pg 3. (Hereafter cited: Moore Report.)

4. (C/AFEO) End-of-Tour Rprt, Maj Gen Burl W. McLaughlin, Comdr, 834th AD, Nov 67 - Jun 69, pg 5-1. (Hereafter cited: McLaughlin Report.)

5. (U) Interview, Brig Gen John H. Herring, Jr., Comdr, 834th AD, by Lt Col Jack T. Humphries, 11 Jun 70. (Hereafter cited: Herring Interview.)

6. (C/AFEO) McLaughlin Report, pg 5-1.

CHAPTER II

1. (U) Interview, Lt Col John Schlight, Deputy Chief, Project CHECO, by Lt Col Jack T. Humphries, 9 May 70.

2. (U) Interview, Lt Col Donald H. Haralson, Dir, Aerial Port Ops, 2d APOG, by Lt Col Jack T. Humphries, 1 Jun 70.

3. Ibid.

4. (U) Interview, Lt Col Kenneth M. Delimont, Dir, Plans and Programs, 2d APOG, by Lt Col Jack T. Humphries, 5 May 70. (Hereafter cited: Delimont Interview.)

* All Extracts from CLASSIFIED documents are UNCLASSIFIED.

5. Ibid.

6. Ibid.

7. (U) Herring Interview.

8. (U) Hist Rprt, 8th APS, 315th TCG (Assault), 1 Jul 64-31 Dec 64, pg 51. (Hereafter cited: 8th APS History Rprt, Jul 64-Dec 64.)

9. (U) Hist Rprt, 8th APS, 315th ACG (CC), 1 Jan 65-30 Jun 65, pg. 41. (Hereafter cited: Hist Rprt, Jan 65-Jun 65.)

10. (U) Hist Rprt, 8th APS, 315th TCG (Assault), 1 Jan 64-30 Jun 64, pg 12. (Hereafter cited: 8th APS History Rprt, Jan 64 - Jun 64.)

11. (U) Hist Rprt, 8th APS, Jul - Dec 64, pg 29.

12. (U) Hist Rprt, 8th APS, Jan - Jun 65, pg 14.

13. (U) Interview, Capt David R. Gammon, Comdr, Det 1, 14th APS, by Lt Col Jack T. Humphries, 22 May 70. (Hereafter cited: Gammon Interview.)

14. (U) Hist Rprt, 8th APS, Jan - Jun 64, pg 22.

15. (U) Interview, Lt Col Robert F. Chadeayne, Station Traffic Officer, 8th APS, by Lt Col Jack T. Humphries, 20 Jun 70.

16. (U) Gammon Interview.

17. (U) Command Briefing, 834th AD, Brig Gen William G. Moore, Jr., 26 Jan 67.

18. (U) Hist Rprt, 2d APOG, 1 Apr 68-30 Jun 68, pg 33.

19. (C/AFEO) McLaughlin Report, pg 5-3.

20. (U) Herring Interview.

21. (U) Hist Rprt, 2d APOG, 1 Jan 66-30 Jun 66, pg 80.

22. (U) Interview, Col Frank E. Tarasko, Comdr, 14th APS, by Lt Col Jack T. Humphries, 21 May 70.

23. (U) Interview, Capt David R. Casey, Comdr, Det 8, 14th APS, by Lt Col Jack T. Humphries, 23 May 70.

24. (U) Interview, Col Robert A. Vsilakas, Vice Commander, 2d APOG, by Lt Col Jack T. Humphries, 1 Jun 70.

25. (S) Final Rprt, Pope AFB, N.C., First Annual Tactical Airlift Symposium, Nov 17-22, 69, pg 71. (Hereafter cited: Symposium Report.)

26. Ibid, pg 72.

CHAPTER III

1. (U) Rprt, Aircraft Cargo Loading Courier, SSG AZR60551-1, "463L Materials Handling Support System," Nov 67, pp 1-2.

2. (U) Hist Rprt, 2d APOG, 1 Apr 69-30 Jun 69, pg 22.

3. (U) Interview, Brig Gen William G. Moore, Jr., Comdr, 834th AD, by Lt Col B. A. Whitaker, 10 Jan 67.

4. (U) Moore Report, pg 4.

5. (U) Ibid, pg 67.

6. (C/AFEO) McLaughlin Report, pg 5-5.

7. Ibid.

8. Ibid, pg 5-6.

9. (U) Ltr, PACAF, subj: Status of Action Items-PACAF Vehicle Support Conference, 14-15 Jan 70, 21 Apr 70. (Hereafter cited: PACAF Letter.)

10. (U) Ltr, subj: Request for Command Assistance, 18 May 70.

11. (U) Hist Rprt, 2d APOG, 10 Oct 69-31 Dec 69, TAB 28.

12. (C/AFEO) McLaughlin Report, pg 5-7.

13. (U) PACAF Letter.

14. (C/AFEO) McLaughlin Report, pg 5-6.

15. (U) Hist Rprt, 2d APOG, 1 Oct 68-31 Dec 68, pg 25.

16. (U) Ltr, subj: 10K Adverse Terrain Forklift Tires, 30 May 70.

17. (U) Interview, MSgt Edward W. Clark, NCOIC, Materiel, 2d APOG, 4 Jun 70. (Hereafter cited: Clark Interview.)

18. (S) Symposium Report, pg 78.

19. (U) Herring Interview.

20. Ibid.

21. (U) Hist Rprt, 2d APOG, 1 Apr 69-30 Jun 69, pg 23.

22. (U) Hist Rprt, 2d APOG, 1 Jan 68-31 Mar 68, pg 29.

23. Ibid, pg 30.

24. (U) Hist Rprt, 2d APOG, Apr 69-Jun 69, pg 23.

25. (U) Interview, Col Charles L. Bunch, Comdr, 15th APS, by Lt Col Jack T. Humphries, 24 May 70;
(U) Interview, Lt Col Robert F. Chadeayne, Sta Traffic Officer, 8th APS, by Lt Col Jack T. Humphries, 9 Jun 70.

26. (C/AFEO) McLaughlin Report, pg 5-3.

27. (U) End-of-Tour Rprt, Col Robert J. Sunde, Comdr, 2d APOG, 6 Oct 69. (Hereafter cited: Sunde Report.)

28. (S) Symposium Report, pg 82.

29. (U) Interview, Col Victor Lisec, Comdr, 8th APS by Lt Col Jack T. Humphries, 9 Jun 70. (Hereafter cited: Lisec Interview.)

30. (U) Delimont Interview.

31. (C/AFEO) McLaughlin Report, pg 5-12.

32. (U) Directive, MACV, No 59-6, 22 Dec 69.

33. (U) Symposium Report, pg 74.

34. (U) Herring Interview.

35. (U) Hist Rprt, 2d APOG, 1 Jul 69-30 Sep 69, pg 17.

36. (U) Moore Report, pg 16.

37. (U) Hist Rprt, 2d APOG, 1 Jul 68-30 Sep 68, pg 21.

38. (U) Clark Interview.

39. (U) Hist Rprt, 2d APOG, Jul 69-Sep 69, pg 17.

40. (U) Clark Interview.

41. Ibid.

42. Ibid.

43. (U) Interview, Maj Ralph C. Alexandre, Dir, Materiel, 2d APOG, 4 Jun 70.

CHAPTER IV

1. (U) Hist Rprt, 2d APOG, Jan 66 - Jun 66.

2. (C/AFEO) McLaughlin Report, pg 5-8.

3. (U) Sunde report.

4. Ibid.

5. (U) Interview, Lt Col Kenneth M. Delimont, Dir, Plans and Programs, 2d APOG, by Lt Col Jack T. Humphries, 8 Jun 70.

6. (U) Sunde report.

7. (S) Symposium Report, pg 79.

8. (U) Interview, Maj Jerry A. Hanson, Dir, Reports and Analysis, 2d APOG, by Lt Col Jack T. Humphries, 18 Jun 70.

CHAPTER V

1. (C/AFEO) McLaughlin Report, pg 5-8.

2. Ibid.

3. (U) Hist Rprt, 2d APOG, Apr 69-Jun 69, pg 10.

4. (U) Hist Rprt, 8th APS, Jan 65-Jun 65, pg iii.

5. Ibid, pg 34.

6. Ibid, pg 38.

7. (U) Moore Report, pg 11.

8. Ibid.

9. (U) Moore Report, pg 11.

10. Ibid, pg 13.

11. Ibid.

12. (C/AFEO) McLaughlin Report, pg 5-8.

13. (U) Tarasko Interview.

14. (S) Symposium Report, pg 81.

15. (S) Ibid, pg 82.

CHAPTER VI

1. (U) Interview, Col Howard E. Bettis, Comdr, 2d APOG, by Lt Col Jack T. Humphries, 10 Jun 70.

2. (U) Lisec Interview.

3. Ibid.

4. (U) Herring Interview.

5. (U) Lisec Interview.

6. (U) Interview, MSgt Richard R. Cleaver, NCOIC, Mobility Section, 8th APS, by Lt Col Jack T. Humphries, 9 Jun 70. (Hereafter cited: Cleaver Interview.)

7. (U) Interview, Capt Lloyd E. Milliman, OIC, Combat Operations, 8th APS, by Lt Col Jack T. Humphries, 9 Jun 70. (Hereafter cited: Milliman Interview.)

8. (U) Hist Rprt, 2d APOG, 1 Apr 68-30 Jun 68, pg 16.

9. Ibid.

10. (U) Milliman Interview.

11. (U) Interview, A1C William A. Beck, Mobility Section, 8th APS, by Lt Col Jack T. Humphries, 9 Jun 70.

12. (U) Lisec and Milliman Interviews.

13. (U) Interview, TSgt William G. Barnhill, NCOIC, Directorate of Information, 834th AD by Lt Col Jack T. Humphries, 10 Jun 70.

14. (U) Lisec Interview.

15. (U) Cleaver Interview.

16. (U) Lisec, Milliman, and Cleaver Interviews.

CHAPTER VII

1. (U) Rprt, "The Vietnam Airlifter," 2 Feb 70, Vol 1, No. 2, pg 1.

2. (U) Herring Interview.

3. (S) Symposium Report, pg B-4.

GLOSSARY

AD	Air Division
AFLC	Air Force Logistics Command
AFSC	Air Force Specialty Code
ALCE	Airlift Control Element
ALMS	Airlift Management System
APOG	Aerial Port Group
APS	Aerial Port Squadron
AT	Adverse Terrain
CCT	Combat Control Team
CONUS	Continental United States
EOD	Explosive Ordnance Disposal
HF	High Frequency
MAC	Military Airlift Command
MAP	Military Assistance Program
MEWS	Mobile Electronic Weighing System
MHE	Materials Handling Equipment
MASS	Materials Handling Support System
NCO	Noncommissioned Officer
PACAF	Pacific Air Forces
PCS	Permanent Change of Station
PSP	Pierced Steel Planking
RT	Rough Terrain
RVN	Republic of Vietnam
SEAOR	Southeast Asia Operational Requirement
SF	Square Foot
SOP	Standing Operating Procedure
SSB	Single Side Band
TDY	Temporary Duty
USAFE	United States Air Forces in Europe
VDM	Vehicle-Deadlined-for-Maintenance
VDP	Vehicle-Deadlined-for Parts
VNAF	Vietnam Air Force
WRAMA	Warner Robins Air Materiel Area

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**Declassified by Office of Air Force History, 2 May 1977